REMARKS

The specification is objected by the Examiner for failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Applicants traverse this objection.

Claims 9 and 19 each disclose that the elongation of the restored rail seat is at least about 10%. The specification supports these claims and teaches, on page 6, lines 7-8, that the polymer material of claims 9 and 19 has an elongation of at least about 10%.

Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giorgini et al (USP No. 7,138,437) in view of Rhodes et al. (USP No. 4,295,259).

Giorgini and Rhodes teaches a method for repairing "spike holes" in "wooden" rail tie assemblies by using a polyurethane "foam" material. (See Abstract). A polyurethane "foam" mixture cannot be effectively applied to a horizontally-extending concrete rail tie void (defect) such as a damaged rail seat. It can only be introduced into a vertically-extending spike hole which is capable of confining the polymeric foam.

Both Giorgini and Rhodes relate to the repair of spike holes. Spike holes are nonexistent in concrete ties.

Claims 1-21 describe the repair of defective concrete ties caused by rail seat abrasion. No mention is made in the subject claims 1-21 of wooden rail ties or spike holes. The present patent application is directed to the development of an effective, easy-to-use, poly(urethane-urea) material for the restoration and repair of concrete railroad ties suffering from a significant problem, namely, rail seat abrasion. Rail seat abrasion is a major problem with respect to concrete rail ties. It is a major safety and maintenance problem for railroad companies who employ concrete rail ties. Rail seat abrasion is not a MAJOR problem with respect to wooden rail ties. Wooden rail ties can be readily resurfaced to rectify any comparable wear problem. Concrete rail ties, on the other hand, cannot be resurfaced to correct abrasion of the rail seat. Instead, the rail seat on a concrete rail ties must be restored.

A sag resistant polymeric repaired article cannot be produced by introducing a polyurethane foam material per se into a rail seat abrasion location of a concrete rail tie. As stated by the Examiner, the Abstract of Giorgini states that the addition of substantial strength enhancers to the polyurethane foam is required to give a repaired spike hole of a wooden rail tie, not a rail seat abrasion of a concrete rail tie, enough strength to prevent deformation during a train pass. In total contradistinction to the teaching of Giorgini, claims 1-21 describe applying a polymeric material comprising a non-foam poly(urethane-urea) material to a rail seat of a concrete rail tie. No strength enhancers are added to the claimed poly(urethane-urea) material in order for it to be substantially sag resistant and maintain its shape without substantial runoff from the concrete rail tie during said restoring of the damage rail seat. Thus, in the absence of strength enhancers, the concrete rail ties are restored, and the rail seat maintains the gauge of a rail assembly under dynamic operating conditions.

With respect to the teachings of Giorgini, this would be totally unexpected. And furthermore, the teachings of Giorgini would teach away from claims 1-21. The claimed polymeric material does not include any of the strength enhancers described by Giorgini. And, even though none of these strength enhancers are added to the subject poly(urethane-urea) material, the claimed polymeric material per se which is applied to the restored rail seat located on the concrete rail tie provides substantial sag resistant and maintains its shape without substantial runoff from the concrete rail tie during restoration of the damaged rail seat. In this way, when concrete rail ties are restored, the rail seat will maintain the gauge of the rail assembly under dynamic operating conditions.

Both Giorgini and Rhodes employ polyurethane foam compositions/ The polymeric material claimed in the above-described patent application is a solid (non-foam), high-density, poly(urethane-urea) material. The use of a foam material would be totally unacceptable and unsuitable for the repair of concrete ties. In fact, major disadvantage of using polymeric foams per se, which includes spike holes in wooden rail ties as well. For example, there is the instability caused to polyurethane foams by environmental moisture. During rainy conditions, or in high humidity, these foamed materials react with water or moisture causing them to foam

excessively. This excess foaming substantially reduces the ability of the filled polymeric material to anchor the tie in a wooden rail. Moreover, polymeric foams, such as for example polyurethane foams, can stove-pipe out of a spike hole or other filled defect due to the reaction of a polyurethane material with water. This creates several negative consequences. It can create copious quantities of excess foam debris (which look like large snow balls) to dispose of thereby needlessly wasting time and materials. In a spike hole filling operation (which is outside the teachings of claims 1-21), the debris typically must be sheared off the tie plate prior to re-spiking. This makes it difficult for a user to drive a spike into the pre-existing hole because the excess foam interferes with an effective and efficient re-spiking operation. Stated another way, this also presents a significant increase in the time required to complete the re-spiking operation for users in the field.

Conventionally, rail seats in concrete rail ties are not made of foam polyurethane. Giorgini teaches repairing spike holes in wooden rail ties using polyurethane foam. It is therefore not obvious to apply the teachings of Giorgini to include the repair of a rail seat portion of a concrete rail tie assembly. Furthermore, the claims of applicants are directed to a non-foam poly(urethane-urea) material not a polyurethane foam. Rail seats are not described in Giorgini to be fabricated from a non-foam poly(urethane-urea) material.

Rail ties are typically wood not concrete. Defects in these wooden rail ties such as spike holes are repaired using the process of Giorgini. Foam polyurethane is added to repair the spike holes in wooden rail ties not in concrete rail ties. Accordingly, it would not have been obvious for one having the ordinary skill in the art to use foam polyurethane to fix a defect other polymeric rail tie components such as a rail seats with the same polymeric material (polyurethane). Clearly, Giorgini does not expressly teach restoring a damaged rail seat on a concrete rail tie by curing a poly(urethane-urea) polymeric material, which is a non-foam polymer, under ambient temperature and pressure conditions.

Rhodes also teaches a method of repairing (filling) spike holes in a wooden railway tie. Rhodes teaches an In Situ method of plugging a spike hole in a wooden railroad tie by adding a polyurethane foam which is curable at outdoor ambient temperature and pressure to make a rigid

repaired article. Rhodes describes a similar process as Giorgini. Rhodes does not expressly teach restoring a damaged rail seat on a concrete rail tie by curing a poly(urethane-urea) polymeric material, which is a non-foam polymer, under ambient temperature and pressure conditions.

The repaired article formed from the process disclosed in Giorgini and Rhodes is a filled spike hole in a wooden rail tie. It does not have the claimed sag resistance as well as maintains the shape without substantial run-off as those disclosed in the instant claims. These properties are not present in Giorgini and Rhodes since they are not required in filling and repairing a spike hole in a wooden rail tie. Therefore, Giorgini and Rhodes teach away from claims 1-21.

The claimed poly(urethane-urea) material has high compression resistance which is critical in maintaining the rail gauge of the rail assembly. In claim 21, for example, the restored rail seat has a modulus which is increased to a level which will resist compressive loading and maintain the rail gauge of the rail assembly. Conversely, a polyurethane foam cannot work in a rail seat abrasion restoration application on a concrete rail tie because (a) it is easily compressed (high level of crushability), (b) lacks durability, (c) it rises unevenly (leading to an uneven surface) and (d) it fails to maintain a level rail seat and stable rail gauge.

If a proposal for modifying the prior art in an effort to attain the claimed invention causes the art to become inoperable or destroys its intended function, then the requisite motivation to make the modification would not have existed. *See In re Fritch*, 972 F.2d at 1265 n.12 ("A proposed modification [is] inappropriate for an obviousness inquiry when the modification render[s] the prior art reference inoperable for its intended purpose."). Therefore, the rejection of claims 1-21 is clearly erroneous for the reasons set forth above.

Regarding claim 11 (paragraph 5 f. of Office Action), the Examiner admits that Giorgini does not teach wherein the curing of the polymeric material can be at an ambient temperature as low as 45 F. The Examiner states that Rhodes teaches that the polyurethane is curable at an outdoor ambient temperature and pressure. (See claim 1). However, in addition to the numerous differences set forth above between Rhodes and the method of claim 11, Rhodes requires, before

the polyurethane has cured, placing rail-holding plates on the wooden ties over the filled spike holes. The polymeric material of claim 11 is self-supporting and is substantially sag resistant and maintaining it's shape without substantial runoff from the concrete rail tie during said restoring of the damage rail seat. Rail-holding plates are not employed in the method of claim 11.

Regarding claim 21 (paragraph 5 g. of Office Action), the Examiner admits that Giorgini does not teach that the curing is done without the use of non-ambient heat and pressure. The Examiner states that Rhodes teaches that the polyurethane is curable at an outdoor ambient temperature and pressure. (See claim 1). As stated above, in addition to the numerous differences set forth above between Rhodes and the method of claim 21, Rhodes requires, before the polyurethane has cured, placing rail-holding plates on the wooden ties over the filled spike holes. The polymeric material of claim 21 is self-supporting and is substantially sag resistant and maintaining it's shape without substantial runoff from the concrete rail tie during said restoring of the damage rail seat. Rail-holding plates are not needed in the method of claim 21.

Regarding claims 2-3 and 12-13 (paragraph 6 of Office Action), the Examiner admits that Giorgini does not teach: (1) wherein the damage rail seat is restored without requiring the use of non-ambient heat and (2) wherein the damage rail seat is restored without requiring the use of non-ambient pressure. The Examiner again states that Rhodes teaches wherein the polyurethane is curable at an outdoor ambient temperature and pressure. (See claim 1). As previously asserted, in addition to the numerous differences set forth above between Rhodes and the method of claims 2-3 and 12-13, Rhodes requires, before the polyurethane has cured, placing rail-holding plates on the wooden ties over the filled spike holes. The polymeric material of claims 2-3 and 12-13 is self-supporting, is substantially sag resistant and maintains it's shape without substantial runoff from the concrete rail tie during said restoring of the damage rail seat. Rail-holding plates are not present in the method of claim 2-3 and 12-13.

Regarding claims 4-5 and 14-15 (paragraph 7 of Office Action), the Examiner states that Giorgini teaches wherein the polyurethane composition has a gel time that can be less than 5 seconds. Assuming that Giorgini can form a polyurethane gel in less than 5 seconds, it is

irrelevant since the polyurethane foam formed therefrom is incapable of restoring a rail seat abrasion on a concrete rail tie for the numerous reasons set forth above.

Regarding claims 6 and 16 (paragraph 8 of Office Action), the Examiner admits that Giorgini does not explicitly teach wherein the Set Time of the polymeric material is sufficient for contouring the restored rail seat in situ without requiring the use of non-ambient heat. However, the Examiner restates that Rhodes teaches that the repair method is In situ and at ambient pressure and temperature. (See claim 1). As stated above, in addition to the numerous differences set forth above between Rhodes and the method of claims 6 and 16, Rhodes requires, before the polyurethane has cured, placing rail-holding plates on the wooden ties over the filled spike holes. The polymeric material of claims 6 and 16 is self-supporting and is substantially sag resistant and maintaining it's shape without substantial runoff from the concrete rail tie during said restoring of the damage rail seat. Rail-holding plates are not provided in the method of claim 6 and 16.

Regarding claims 7-10 and 17-20 (paragraph 9 of Office Action), the Examiner admits that the combination of Giorgini and Rhodes do not expressly teach: (1) rail ties having a restored rail seat which maintains the gauge of a rail assembly under dynamic operating conditions; (2) the modulus of a restored rail seat which is increased to a level which will resist compressive loading and maintain the rail gauge of the rail assembly; (3) the Elongation of a restored rail seat is at least about 10%; and (4) the Shore D (24 hour) Hardness of a restored rail seat is at least about 65. As stated above, in addition to the numerous differences set forth above between Rhodes and the method of claims 7-10 and 17-20, Rhodes requires, before the polyurethane has cured, placing rail-holding plates on the wooden ties over the filled spike holes. Neither Giorgini nor Rhodes can restore a damaged rail seat on a concrete rail tie so it has the properties set forth in (1)-(4) above. The polymeric material of claims 7-10 and 17-20 is self-supporting and is substantially sag resistant and maintaining it's shape without substantial runoff from the concrete rail tie during said restoring of the damage rail seat. Rail-holding plates are not used in the method of claim 6 7-10 and 17-20.

Giorgini teaches that strength enhancers, hydrophobic enhancers, and impact absorption enhancers can be added to polyurethane to make a more stable repaired article. (See abstract). No strength enhancers are added to the claimed poly(urethane-urea) material in order for it to be substantially sag resistant and maintain its shape without substantial runoff from the concrete rail tie during said restoring of the damage rail seat. Thus, unexpectedly, in the absence of strength enhancers, the concrete rail ties of claims 1-21 are restored, and the rail seat maintains the gauge of a rail assembly under dynamic operating conditions. Claims 1-21 teach away from the teachings of Giorgini. This is further emphasized in claim 21 where the polymeric material consists essentially of a poly(urethane-urea) material.

Applicants traverse the statement made by the Examiner that one of ordinary skill in the art would have obviously recognized that the claimed properties of the restored rail seat would have naturally flowed from the claimed process and the claimed materials used in the claimed process. This statement is totally without support for the numerous reasons set forth above. Giorgini in view of Rhodes does not provide the same process and/or the same materials as the claimed invention. It is abundantly clear when one examines the many arguments presented above that one of ordinary skill in the art would not have obviously recognized, with all things being equal (process and materials), that the process of Giorgini and Rhodes would have produced a restore rail seat having the claimed properties.

A Declaration Traversing Cited References under 37 C.F.R. 1.132 is provided from one of the inventors, Robert M. Loomis. This Declaration supports the above remarks regarding the actual teachings of Giorgini and Rhodes, and confirms substantial differences between these references and the pending claims 1-21.

The above-described obviousness rejection is not based on a valid combination of references. Instead, the Examiner has interposed his own teaching which does not have basis in cited references. Numerous disparities between the claimed method and the cited prior art have been pointed out above. Lacking such a proper teaching, the Examiner has impermissibly used Applicants' own teachings to observe the prior art for the claimed elements, and then to combine them as claimed by Applicants. This 103 rejection is clearly hindsight reconstruction.

For the foregoing reasons, reconsideration and allowance of claims 1-21 of the application as amended is requested. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears it would be helpful in advancing this case.

Respectfully submitted,

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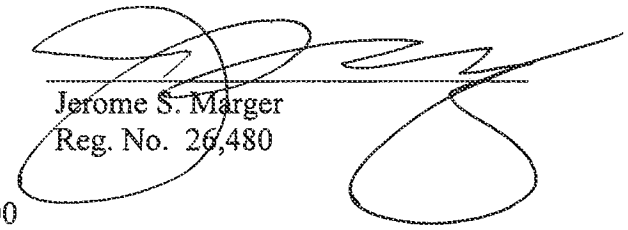

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